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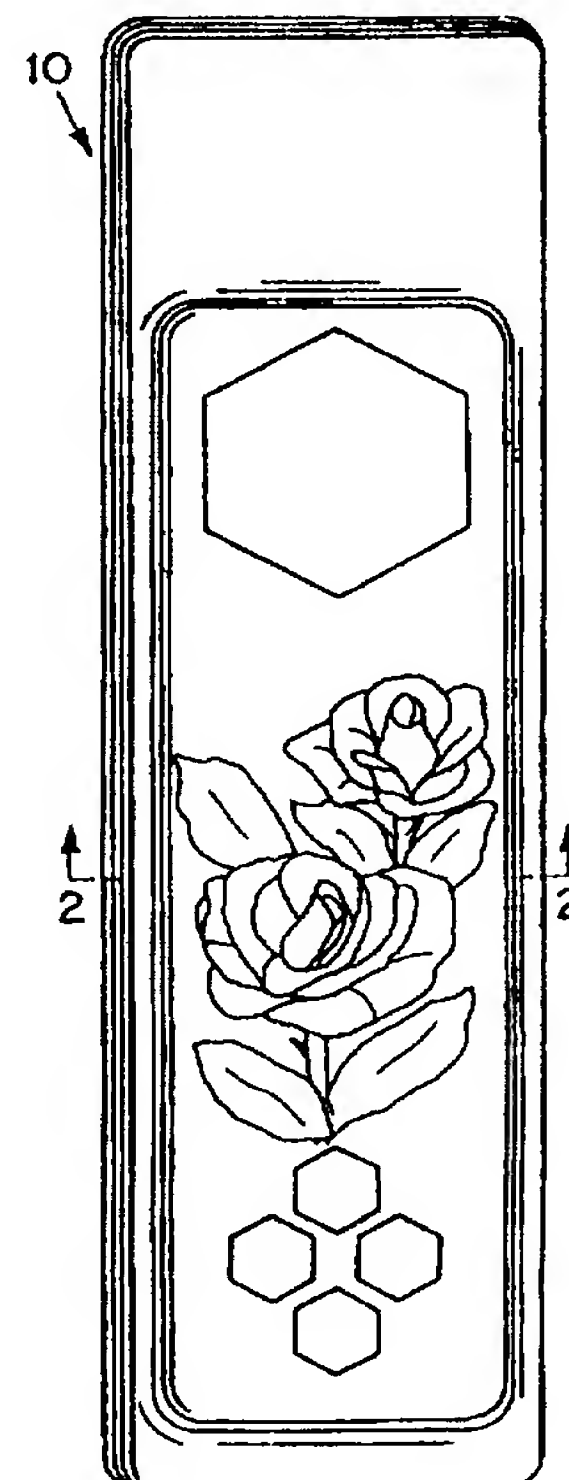
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(54) Title: PLASTIC ENVELOPE ASSEMBLY AIR FRESHENER DISPENSER DEVICE

(57) Abstract

This invention provides an air freshener dispenser device that is in the form of a plastic envelope which has a content of a volatile air freshener medium. In one embodiment the envelope is constructed of two elongated plastic membrane laminates which are sealed along a peripheral margin that frames a reservoir enclosure between the opposing membrane laminate inner surfaces. Each membrane laminate is composed of an inner vapor-permeable thin film, and an outer vapor-impermeable thin film. The reservoir enclosure additionally contains an unattached semi-rigid strip which has dimensions that closely approximate the area dimensions of the reservoir enclosure, and which has at least one structural aperture which permits free access between the membrane laminate range surfaces. The strip provides semi-rigidity to the air freshener dispenser device.



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PLASTIC ENVELOPE ASSEMBLY ~~AIR FRESHENER DISPENSER DEVICE~~

5 Technical Field

This invention generally relates to dispensers of vaporizable media. More specifically, this invention relates to a device for dispensing a fragrance or deodorant in the form of a vapor for air freshening in an enclosed environment.

10

Background Art

The need for effectively combating airborne malodors in homes and enclosed public buildings, by odor masking or destruction, is well established. Various kinds of vapor-dispensing devices have been employed for this purpose. The most common of such devices is the aerosol container which propels minute droplets of an air freshener composition into the air. Another common type of dispensing device is a dish containing or supporting a body of gelatinous matter which when it dries and shrinks releases a vaporized air-treating composition into the atmosphere. Other products such as deodorant blocks and liquid wicks are also used for dispensing air-treating vapors into the atmosphere by evaporation. Another group of vapor-dispensing devices utilizes a carrier material such as paperboard impregnated or coated with a vaporizable composition.

A number of recent developments include a liquid air-treating composition in an enclosure, all or part of which is formed of a polymeric film through which the air-treating composition can migrate to be released as a vapor at an outer surface. Use of this type of permeable polymeric membrane controls the dispensing of air-treating vapors and tends to eliminate great variations in the rate of dispensing over the life of the product. Such products

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are considered advantageous when compared with the many air-treating products for which the rate of vapor release drops substantially over the life of the product.

Products of the type having a sheet of permeable polymeric material to control the emission of air-treating vapors may be in a variety of forms. In some, the polymeric sheet covers a cylindrical container, while in others the liquid air-treating material is trapped between the permeable sheet and an impermeable plastic sheet. In still others, the permeable polymeric material forms a flexible pouch having a content of the air-treating liquid. The liquid, prior to activation, is isolated within a breakable container such as a glass vial or an impermeable plastic inner pouch, or the like.

Publications of background interest in connection with air freshener devices include United States Patent Numbers 2,481,296; 2,594,714; 3,785,556; 3,790,081; 3,946,945; 4,130,245; 4,220,281; 4,306,679; 4,382,548; 4,502,630; 4,558,820; 4,583,686; 4,615,486; 4,660,763; 4,630,775; 4,739,928; 4,849,606; 4,948,047; 4,595,925; 4,948,047; 4,960,240; 4,983,578; 4,998,671; and the like; incorporated by reference.

Some air freshener dispensers are expensive to manufacture. Other air freshener dispensers are inexpensive to produce, but tend to have inferior construction and functionality.

There remains a need for a well-constructed air freshener dispenser device which can be mass-produced economically and which can deliver a vapor medium at a controlled uniform rate over an extended period of time.

Accordingly, it is an object of this invention to provide an improved air freshener dispenser device for delivering an odorant and/or deodorant vapor in an enclosed environment.

It is another object of this invention to provide an air freshener dispenser device with a primary structure that is a plastic envelope assembly

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composed of thin membrane laminates which can be produced economically by a thermoforming means in a continuous process.

It is a further object of this invention to provide an elongated reservoir enclosure which has a volatile air freshener content and an internally disposed
5 semi-rigid support member, and which is sandwiched and sealed between two translucent or transparent thin film permeable membranes.

Other objects and advantages of the present invention shall become apparent from the accompanying description and drawings.

10

Brief Summary of the Invention

One or more objects of the present invention are accomplished by the provision of an air freshener dispenser device which is a plastic envelope assembly comprising:

- (a) an elongated thin membrane which is
15 juxtapositioned coextensively with a second elongated thin membrane; wherein the two membranes have dimensional correspondence, and are bonded along a peripheral margin that frames a central section of opposing membrane
20 surfaces which form a reservoir enclosure; and wherein each membrane is permeable to a volatile medium in the reservoir enclosure;
- (b) a volatile air freshener medium which is contained within the reservoir enclosure;
- 25 (c) a thin peelable impermeable membrane which is in a laminate formation with each respective permeable membrane to prevent volatilization of the air freshener ingredient through the

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permeable membrane from the reservoir enclosure; and

(d) a thin semi-rigid strip which is situated unattached within the reservoir enclosure, and has

5 dimensions which closely approximate the area dimensions of the reservoir enclosure; wherein the strip functions as a stiffening means which imparts semi-rigidity to the dispenser article, and wherein the strip structure has at least one

10 aperture which provides free access between the inner surfaces of the two permeable membranes.

Description of the Drawings

FIG. 1 is a perspective view of an invention air freshener dispenser

15 device with an imprinted design.

FIG. 2 is a sectional view taken along lines 2-2 of FIG. 1.

FIG. 3 is a perspective view of a FIG. 1 air freshener dispenser device which illustrates the removal of two peelable vapor-impermeable membranes.

FIG. 4 is a perspective view of a FIG. 3 air freshener dispenser device

20 with the complete removal of two peelable vapor-impermeable membranes.

FIGS. 5-8, respectively, illustrate aperture configurations in a semi-rigid thermoplastic strip which is an insert in the reservoir enclosure of an invention air freshener as shown in FIG. 4.

Detailed Description of the Invention

FIG. 1 illustrates a present invention air freshener dispenser device which has a design imprinted on its upper surface.

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A FIG. 1 type of air freshener dispenser device has a semi-rigid structure, and its typical dimensions are about four inches in length, about one half to one inch in width, and about one eighth to one fourth inch in thickness.

A FIG. 1 type of air freshener dispenser device can be utilized by
5 peeling one of the outer impermeable membranes partially or completely, or peeling the outer impermeable membrane from each side of the dispensing device.

FIG. 2 is a cross-sectional end view of a FIG. 1 type of air freshener dispenser device which has an elongated grating of parallel apertures 12 in
10 semi-rigid strip 16. Membranes 14 and 15 are in a convex configuration to provide an increased capacity for air freshener medium 18. Thin film vapor-permeable membranes 14 and thin film vapor-impermeable membranes 15 are in a laminate formation, and membranes 14 and 15 are bonded along periphery margin 13. Semi-rigid strip 16 is unattached within the reservoir enclosure
15 which contains air freshener medium 18.

FIG. 3 is a prospective view of air freshener dispenser device 10 of FIG. 1, in which two vapor-impermeable membranes 15 are being peeled from the surfaces of vapor-permeable membrane 14. Membranes 14 are bonded along peripheral margin 13.

20 FIG. 4 is a perspective view of the air freshener dispenser device of FIG. 3, in which vapor-impermeable membranes 15 are completely removed. FIG. 4 illustrates air freshener dispenser device in which vapor-permeable membranes 14 are transparent. Semi-rigid strip 16 is visible through membranes 14, as is a reservoir content of air freshener medium which is not
25 shown in FIG. 4. Apertures 12 in FIG. 4 correspond to grating apertures 12 illustrated in FIG. 2.

Other aperture 12 configurations are represented in FIGS. 5-8. Multiple apertures 12 provide a reservoir capacity for air freshener 18 as

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illustrated in FIG. 2. Multiple apertures 12 can be in the form of a design pattern, as illustrated in FIG. 5.

Thin film vapor-impermeable membrane 15 is bonded to vapor-permeable membrane 14 in the form of a laminate. Vapor-impermeable
5 membrane 15 is peelable, so that its partial or complete removal allows air freshener medium 18 to migrate through vapor-permeable membrane 14 and volatilize into the atmosphere.

Semi-rigid strip 16 can be provided by thermoform molding of a thermoplastic polymer such as polyethylene, polypropylene, polyvinyl
10 chloride, and the like.

Vapor-permeable membrane 14 can be in the form of a flexible thin film of a thermoplastic polymer such as polyethylene, isotactic polypropylene, cellulose acetate, and the like. Membrane 14 permits migration of the enclosed volatile air freshener medium 18, either as a liquid or a vapor,
15 depending on the type of membrane 14 being employed. Membrane 14 can be a microporous type (submicron pores), such as isotactic hydrophobic polypropylene film sold under the CELGARD tradename (Celanese). Microporous thermoplastic polymer films are described in U.S. 3,055,297; incorporated by reference.

20 Vapor-impermeable membrane 15 can be in the form of a flexible thin film such as aluminum foil or nylon film, which is peelable from its adhering bond to vapor-permeable membrane 14.

In a preferred embodiment, a laminate of membrane 14 and membrane 15 is preformed, and then two identical sections are juxtapositioned and
25 formed into a present invention envelope type product which has a content of air freshener medium 18, and semi-rigid strip 16, in a sealed reservoir enclosure. Production of a laminate of permeable and impermeable membranes is illustrated in U.S. 4,145,001; incorporated by reference.

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Air freshener ingredient 18 can be any air treating material which can migrate through membrane 14 and disperse into the atmosphere in vapor form. Typically air freshener ingredient 18 is a fragrance or a deodorant in liquid or gel form.

5 Preferably, air freshener ingredient 18 is a liquid fragrance comprising one or more volatile organic compounds which are available from perfumery suppliers such as Firmenich Inc., Takasago Inc., Noville Inc., Quest Co., and Givaudan-Roure Corp.

10 Most conventional fragrance materials are volatile essential oils. The fragrance can be a synthetically formed material, or a naturally derived oil such as oil of Bergamot, Bitter Orange, Lemon, Mandarin, Caraway, Cedar Leaf, Clove Leaf, Cedar Wood, Geranium, Lavender, Orange, Origanum, Petitgrain, White Cedar, Patchouli, Lavandin, Neroli, Rose absolute, and the like.

15 A wide variety of chemicals are known for perfumery, such as aldehydes, ketones, esters, alcohols, terpenes, and the like. A fragrance can be relatively simple in composition, or can be a complex mixture of natural and synthetic chemical components.

20 A typical scented oil can comprise woody/earthy bases containing exotic constituents such as sandalwood oil, civet, patchouli oil, and the like. A scented oil can have a light floral fragrance, such as rose extract or violet extract. Scented oil also can be formulated to provide desirable fruity odors, such as lime, lemon or orange.

25 Synthetic types of fragrance compositions either alone or in combination with natural oils are described in United States Patents 4,314,915; 4,411,829; and 4,434,306; incorporated herein by reference. Other artificial liquid fragrances include geraniol, geranyl acetate, eugenol, isoeugenol,

linalool, linalyl acetate, phenethyl alcohol, methyl ethyl ketone, methylionone, isobornyl acetate, and the like.

A fragrance ingredient also can be in the form of a crystalline solid, which have the ability to sublime into the vapor phase at ambient
5 temperatures. A crystalline fragrance starting material can be selected from organic compounds which include vanillin, ethylvanillin, coumarin, tonalid, calone, heliotropene, musk xylol, cedrol, musk ketone, benzophenone, raspberry ketone, methyl naphthyl ketone beta, phenyl ethyl salicylate, veltol, maltol, maple lactone, proeugenol acetate, evernyl, and the like. This type of
10 fragrance can contribute a long term air-treating capability to an air freshener dispenser device.

In a further embodiment this invention provides a method for the manufacture of a claim 1 type of air freshener dispenser device, which comprises (1) providing two elongated thin membrane laminates of
15 dimensional correspondence and with juxtapositional surfaces; wherein each laminate is composed of an inner vapor-permeable thin film, and a coextensive outer vapor-impermeable thin film; and wherein the two membrane laminates are bonded along a peripheral margin on three sides of the membrane laminates, thereby framing a central section of opposing membrane laminate
20 surfaces and forming a reservoir enclosure; (2) inserting a thin semi-rigid strip through the unbonded open side of the two proximate membrane laminates, and into the reservoir enclosure; wherein the strip has dimensions which closely approximate the area dimensions of the reservoir enclosure; and wherein the strip structure has at least one aperture which provides free access
25 between the inner surfaces of the two membrane laminates; (3) charging the reservoir enclosure with a volatile air freshener medium through the unbonded open side of the membrane laminates; and (4) bonding the open side of the

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membrane laminates to seal the volatile air freshener medium within the reservoir enclosure.

The two laminate sections with juxtapositioned flat surfaces typically are bonded along the peripheral margin by heat-sealing means. The inner
5 vapor-permeable membranes of the two laminates are adapted to heat-seal with each other. The outer vapor-impermeable membranes of the two laminates are adapted to maintain the peelable property under the heat-sealing temperature conditions applied to the margin around the edges of the two superimposed laminate sections.

10 A present invention air freshener device can be produced in high volume from relatively inexpensive plastic materials. After usage, the device qualifies for disposal as a non-hazardous solid waste.

The present invention also contemplates an integrated combination of a FIG. 1 type air freshener device and a dispensing holder structure. The FIG. 1
15 device then functions as a replaceable refill cartridge.

Industrial Applicability

The invention is an air freshener dispenser device useful to scent the air
20 in a room of a dwelling, an automobile, or any other appropriate space. Stated as a method of manufacture, the invention is directly applicable to the practical manufacture of such useful devices.

Claims:

1. An air freshener dispenser device which is a plastic envelope assembly comprising:

- (a) an elongated thin membrane which is
5 juxtapositioned coextensively with a second
 elongated thin membrane; wherein the two
 membranes have dimensional correspondence,
 and are bonded along a peripheral margin that
 frames a central section of opposing membrane
10 surfaces which form a reservoir enclosure; and
 wherein each membrane is permeable to a
 volatile medium in the reservoir enclosure;
- (b) a volatile air freshener medium which is contained
 within the reservoir enclosure;
- 15 (c) a thin peelable impermeable membrane which is
 in a laminate formation with each respective
 permeable membrane to prevent volatilization of
 the air freshener ingredient through the
 permeable membrane from the reservoir
20 enclosure; and
- (d) a thin semi-rigid strip which is situated unattached
 within the reservoir enclosure, and has
 dimensions which closely approximate the area
 dimensions of the reservoir enclosure; wherein
25 the strip functions as a stiffening means which
 imparts semi-rigidity to the dispenser article, and
 wherein the strip structure has at least one

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aperture which provides free access between the inner surfaces of the two permeable membranes.

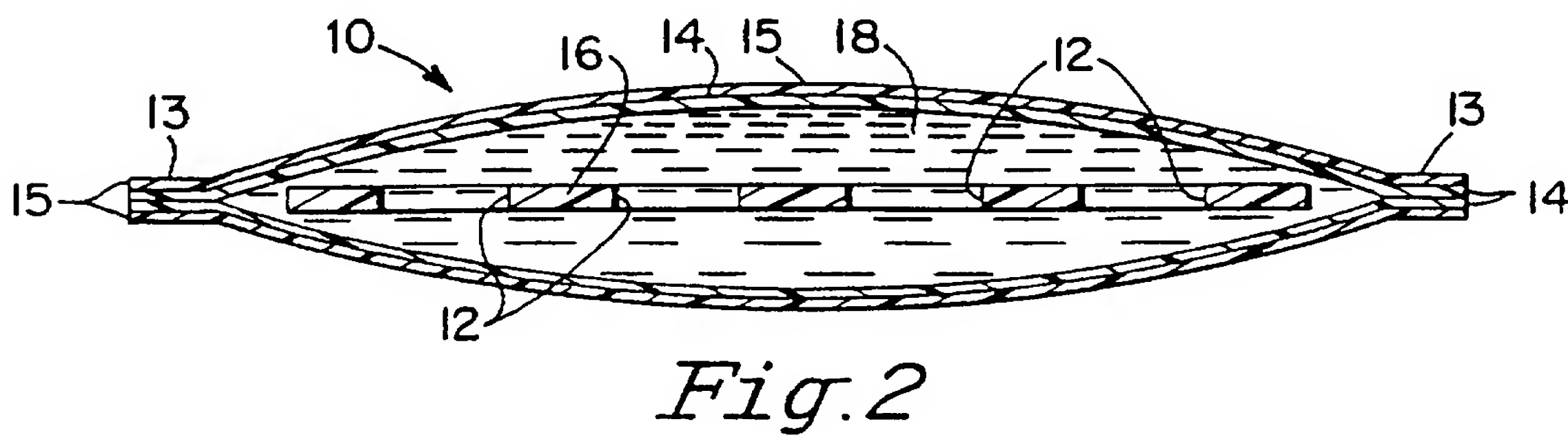
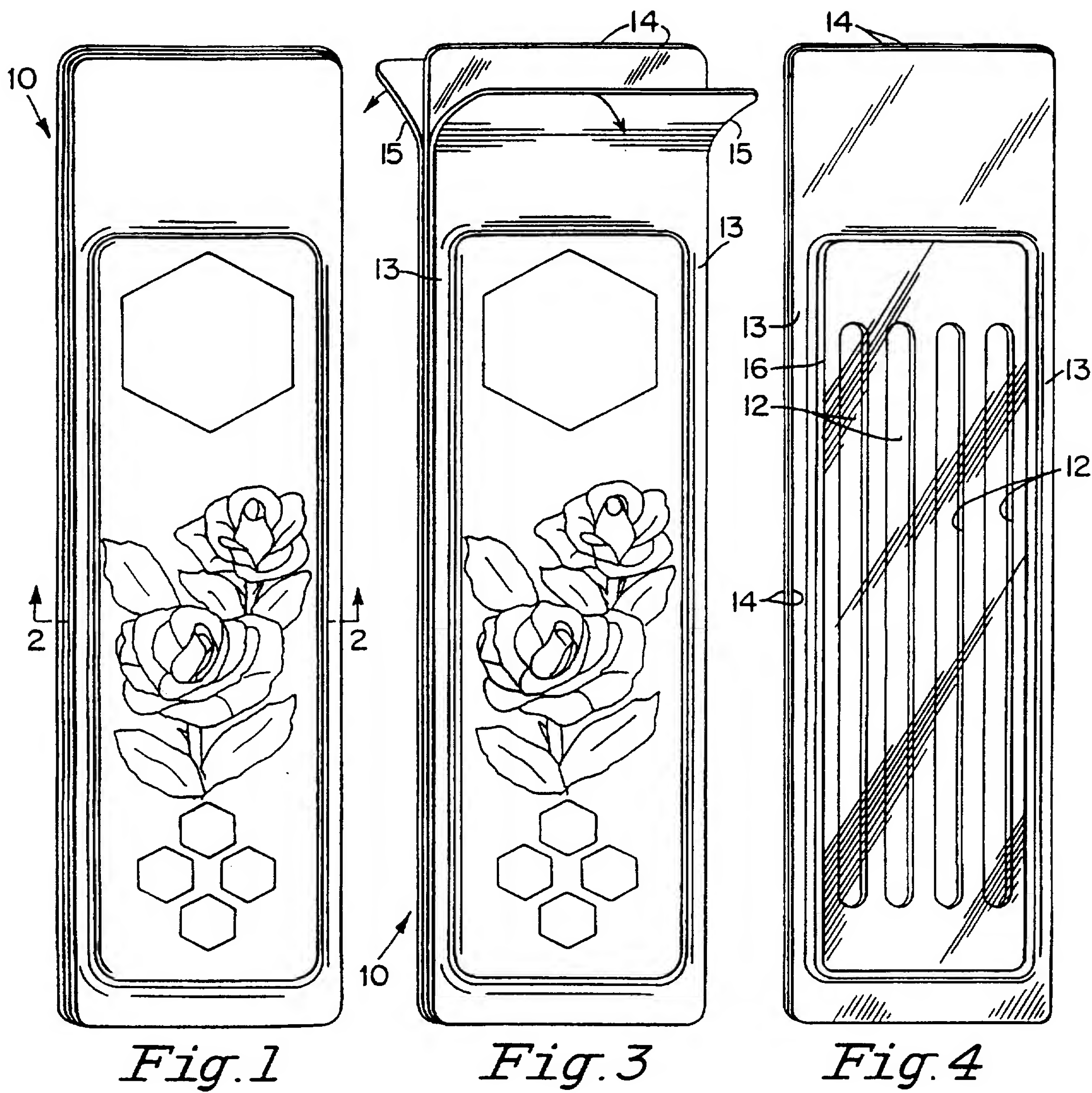
2. A dispenser device in accordance with claim 1 wherein the
5 permeable membrane is a polyvinyl thin film.
3. A dispenser device in accordance with claim 1 wherein the impermeable membrane is an aluminum foil or nylon film.
- 10 4. A dispenser device in accordance with claim 1 wherein the volatile air freshener is a fragrance in a liquid, gel or crystalline form.
5. A dispenser device in accordance with claim 1 wherein the respective permeable membranes have transparency, and the content of a
15 volatile air freshener medium in the reservoir enclosure is visible.
6. A dispenser device in accordance with claim 1 wherein the semi-rigid strip is a molded thermoplastic structure.
- 20 7. A dispenser device in accordance with claim 1 wherein the semi-rigid strip is a molded polyethylene or polypropylene structure.
8. A dispenser device in accordance with claim 1 wherein the respective permeable membranes have transparency, and the semi-rigid strip in
25 the reservoir enclosure has multiple apertures which form a design pattern.
9. A dispenser device in accordance with claim 1 wherein the outer impermeable membrane is imprinted with a logo design.

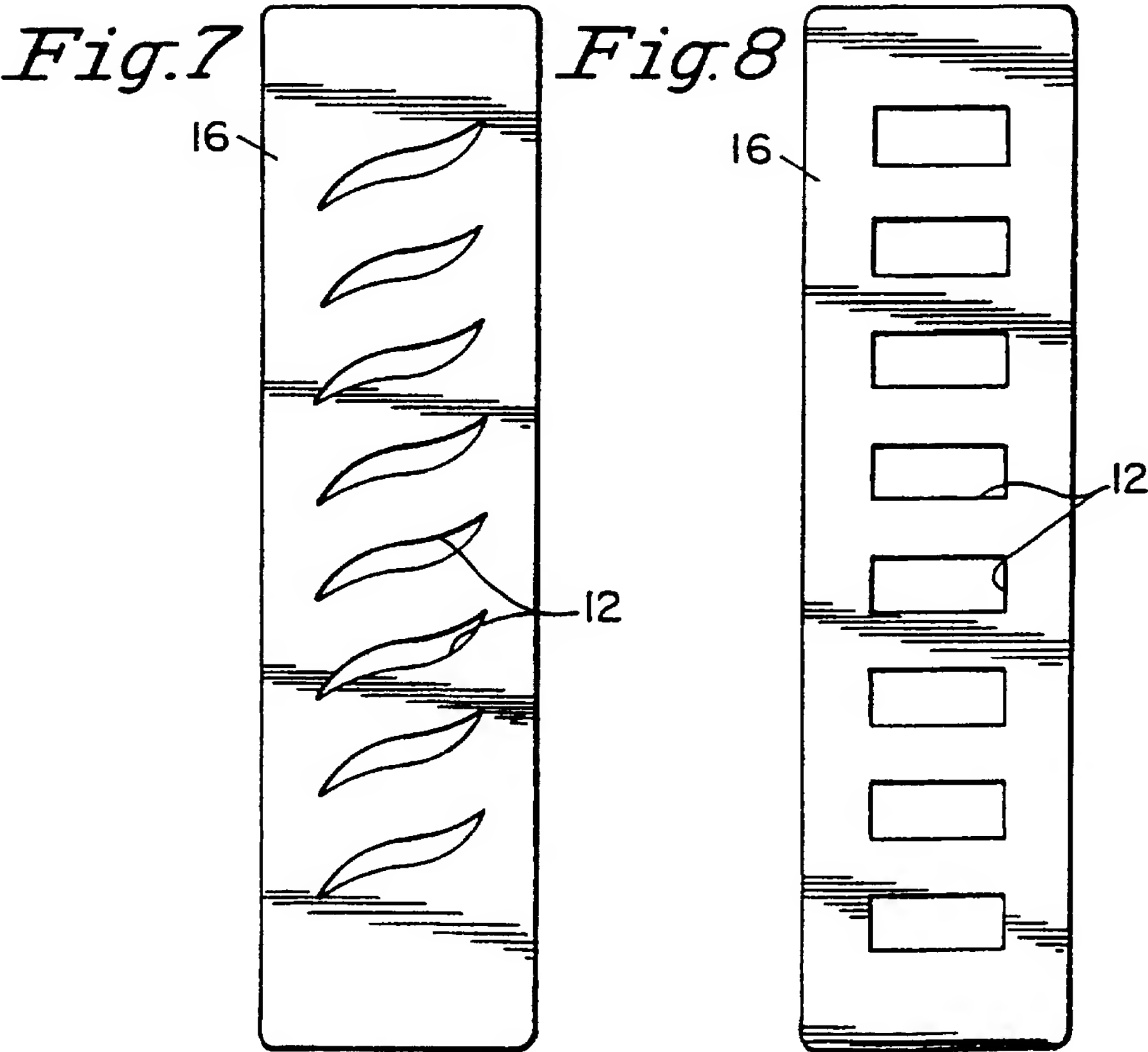
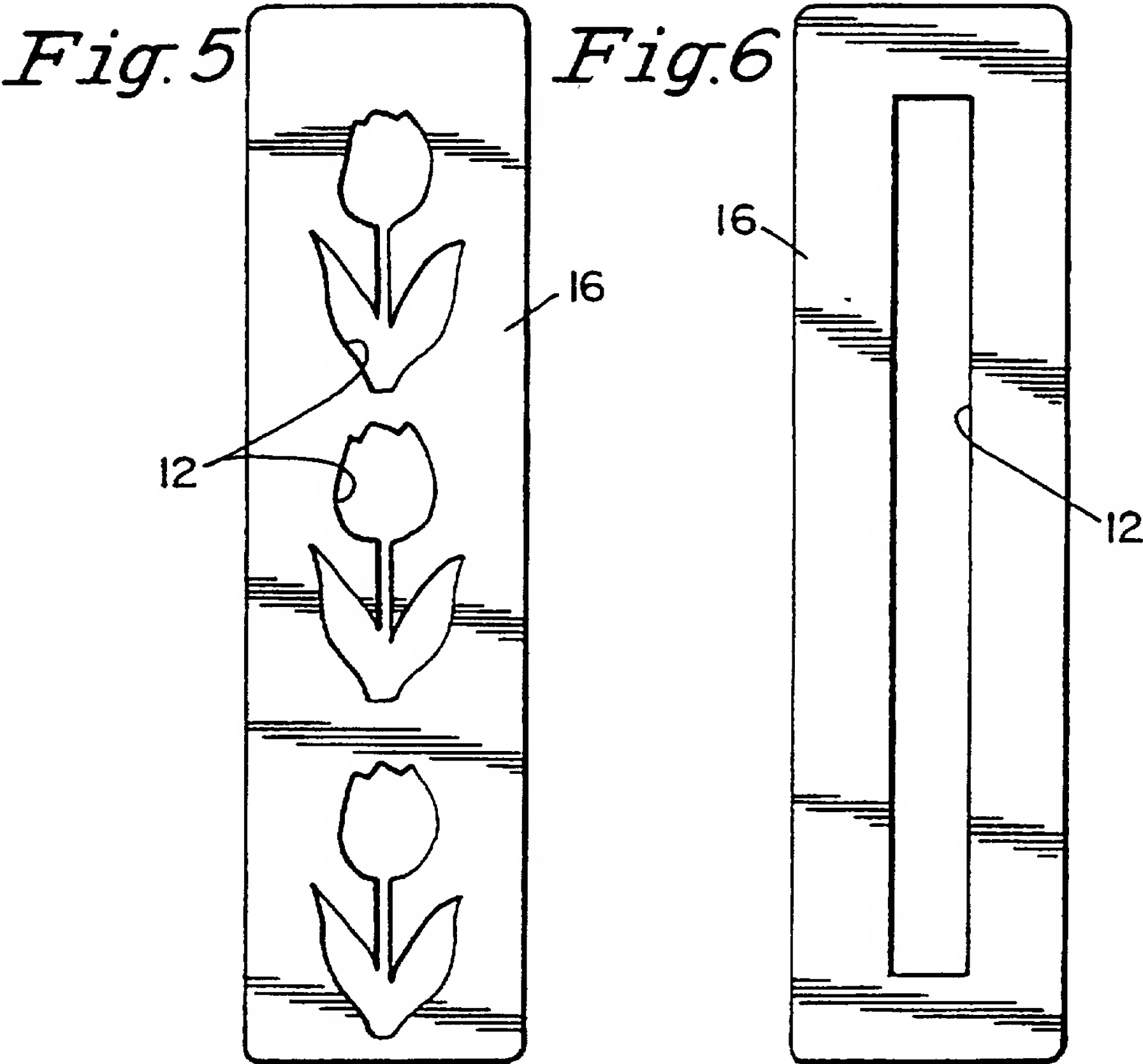
- 12 -

10. A dispenser device in accordance with claim 1 which is incorporated in a dispenser housing structure, and functions as a replaceable refill cartridge.

5 11. A method for the manufacture of a claim 1 type of air freshener dispenser device, which comprises (1) providing two elongated thin membrane laminates of dimensional correspondence and with juxtapositional surfaces; wherein each laminate is composed of an inner vapor-permeable thin film, and a coextensive outer vapor-impermeable thin film; and wherein the two
10 membrane laminates are bonded along a peripheral margin on three sides of the membrane laminates, thereby framing a central section of opposing membrane laminate surfaces and forming a reservoir enclosure; (2) inserting a thin semi-rigid strip through the unbonded open side of the two proximate membrane laminates, and into the reservoir enclosure; wherein the strip has
15 dimensions which closely approximate the area dimensions of the reservoir enclosure; and wherein the strip structure has at least one aperture which provides free access between the inner surfaces of the two membrane laminates; (3) charging the reservoir enclosure with a volatile air freshener medium through the unbonded open side of the membrane laminates; and (4)
20 bonding the open side of the membrane laminates to seal the volatile air freshener medium within the reservoir enclosure.

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INTERNATIONAL SEARCH REPORT

Internatio Application No
PCT/US 97/08164A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61L9/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 97 22370 A (JOHNSON & SON INC S C ;HARRIES ALUN (GB)) 26 June 1997 see the whole document ---	1
Y	WO 95 15772 A (PAUL LEONARD) 15 June 1995 see claims; figures ---	1-11
Y	US 3 343 664 A (E.J.POITRAS) 26 September 1967 see the whole document ---	1-11
A	EP 0 081 791 A (HENKEL KGAA) 22 June 1983 see claims; figures ---	1-11
A	EP 0 093 262 A (HYMAN SY) 9 November 1983 ---	
A	WO 84 02654 A (FIRMENICH & CIE) 19 July 1984 ---	
	--- -/-	

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Date of the actual completion of the international search

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Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

Internatio	Application No
PCT/US 97/08164	

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 1 316 894 A (L.E. PATRIGOT) 26 April 1963	

A	GB 2 123 352 A (HAKUGEN CO LTD) 1 February 1984	

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internatic Application No

PCT/US 97/08164

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9722370 A	26-06-97	AU 1420297 A	14-07-97

WO 9515772 A	15-06-95	US 5372303 A	13-12-94
		US 5556030 A	17-09-96
		AU 1211995 A	27-06-95
		BR 9408254 A	27-05-97
		CA 2177078 A	15-06-95
		CN 1141596 A	29-01-97
		EP 0732946 A	25-09-96
		NZ 277179 A	24-02-97
		US 5611486 A	18-03-97
		ZA 9409351 A	16-11-95

US 3343664 A	26-09-67	GB 1189855 A	29-04-70

EP 0081791 A	22-06-83	DE 3149508 A	23-06-83

EP 0093262 A	09-11-83	US 4285468 A	25-08-81
		AU 531497 B	25-08-83
		AU 4966179 A	13-11-80
		CA 1133853 A	19-10-82
		EP 0019010 A	26-11-80

WO 8402654 A	19-07-84	CH 662736 A	30-10-87
		AU 566182 B	08-10-87
		AU 2349084 A	02-08-84
		BE 898675 A	13-07-84
		BR 8404703 A	26-12-84
		CA 1230048 A	08-12-87
		DE 3490012 C	14-01-93
		DE 3490012 T	24-01-85
		FR 2539492 A	20-07-84
		GB 2149664 A,B	19-06-85
		JP 4025022 B	28-04-92
		JP 60500321 T	14-03-85
		NL 189110 B	17-08-92
		NL 8420001 T	03-12-84
		US 4634614 A	06-01-87

FR 1316894 A	26-04-63	NONE	

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internatic Application No

PCT/US 97/08164

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2123352 A	01-02-84	JP 1493720 C	20-04-89
		JP 58155861 A	16-09-83
		JP 63040541 B	11-08-88
		US 4476171 A	09-10-84
